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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,002	10/30/2003	Shinobu Sakurada	1300-000008	7421
27572	7590	09/11/2006	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			DIXON, MERRICK L	
			ART UNIT	PAPER NUMBER
			1774	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,002

Applicant(s)

SAKURADA ET AL.

Examiner

Merrick Dixon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on rce filed 8-16-06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

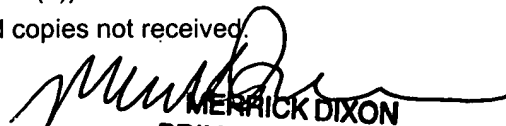
Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


MERRICK DIXON
PRIMARY EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

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1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP-2001-75297 in view of Norris et al(US 6858079 B2).

The primary reference teaches the claimed invention including a liquid crystal compound having charge transfer property and ferroelectricity. The reference's crystal compound has $>1 \times 10^{-5} \text{ cm}^2/\text{V}\cdot\text{sec}$ positive hole mobility. The reference further teaches that the liquid crystal has 6 pi electron-based aromatic group, L, 10 pi electron based aromatic group, M, and/or 14 pi electron base aromatic group, N, cores. Where $L+M+N=1$ to 4. Each of L, M and M is integers 1-4. Further, the liquid crystal compound has 2-phenyl naphthalene ring. In section [0011] of the reference, the core includes phenylnaphthalene, biphenyl, benzothiazole and thiophene with side chain of alkyl or alkoxy group as required by claim 3. The primary reference is however silent to the aspect of repeatedly purifying its organic semiconductor material. The secondary reference to Norris et al, however teaches this aspect. Norris teaches that it is known in the art to repeatedly purify semiconductor material, as taught by the primary reference to expel impurities therein- col 4, lines 24-48; col 9, lines 44-47; col 16, lines 9-20; claims 20 and 49. It would have been obvious to one of ordinary skill in the art at the time the invention is made to combine the teachings of the secondary reference to Norris and repeatedly purify the conductive material in an attempt to discard all

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impurities therein motivated by the desire to form perfected articles- col 8, lines 20-24.

Concerning claim 2, the secondary reference teaches heating its conductive material- col 4, lines 35-39. Concerning claim 3, it is submitted the resulting heating of the conductive material would indeed cause same material to exhibit similar claimed smectic phase, as claimed and in the absence of unexpected results.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-33,990 in view of Norris et al (US 6858079 B2). The primary reference teaches a photoconductive layer composed of an organic semiconductor liquid crystalline and dielectric layer on electrodes. the reference 's liquid crystal compound has $>1 \times 10^{-5}$ cm²/V.sec electron mobility and $>1 \times 10^{-5}$ cm²/V.sec positive hole mobility. The reference teaches liquid crystal compound, with 6 pi electron based aromatic group, L, 10 pi electron based aromatic group, N, 14 pi electron based aromatic group. $L+M+N=1-4$. Such inclusions would cause the material to behave in similar manner as claimed and required by claims 2 and 3. See section [0010] of the reference. Also, see sections [0016-0017].

. The primary reference is, however, silent to the aspect of repeatedly purifying its organic semiconductor material. The secondary reference to Norris et al, however teaches this aspect. Norris teaches that it is known in the art to repeatedly purify semiconductor material, as taught by the primary reference to expel impurities therein- col 4, lines 24-48; col 9, lines 44-47; col 16, lines 9-20; claims 20 and 49. It would have been obvious to one of ordinary skill in the art at the time the invention is made to

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combine the teachings of the secondary reference to Norris and repeatedly purify the conductive material in an attempt to discard all impurities therein motivated by the desire to form perfected articles- col 8, lines 20-24. Concerning claim 2, the secondary reference teaches heating its conductive material- col 4, lines 35-39. Concerning claim 3, it is submitted the resulting heating of the conductive material would indeed cause same material to exhibit similar claimed smectic phase, as claimed and in the absence of unexpected results.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shinichi et al(US 5585483 A) is cited of interest for its teachings as set forth..

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Applicants who wish to send a facsimile (draft copies) for the examiner's immediate review can do so by using the Examiner's personal fax number at 571-273-1520. The faxing of all papers must conform with the notice published in the Official Gazette, 1096 O.G. 30 (November 15, 1989). **NOTE: All facsimiles sent to the examiner's personal fax number should be in draft-forms and will be treated as informal.**

Same facsimiles will not be entered in the related applications unless otherwise agreed and noted by the examiner.

The fax number for all other fascimile is 571-273-8300.

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Information about **the status of an application** may be obtained from the Patent Information Retrieval system (**Private PAIR**).

Status inquiries for **published applications** may be retrieved from either **Private PAIR** or **Public PAIR**. Questions about the PAIR system should be directed to the Electronic Business Center at **866-217-9197**.

Any questions concerning the instant communication should be directed to Examiner Dixon, at 571-272-1520, Mondays, Wednesdays and Thursdays, between 12 noon and 8 PM, eastern time .

A handwritten signature in black ink, appearing to read 'Merrick Dixon', with a long horizontal flourish extending to the right.

Merrick Dixon

Primary Examiner

Group 1700